

O. G. DODGE.
COMBINATION LOCK.
APPLICATION FILED NOV. 25, 1910.

1,019,136.

Patented Mar. 5, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

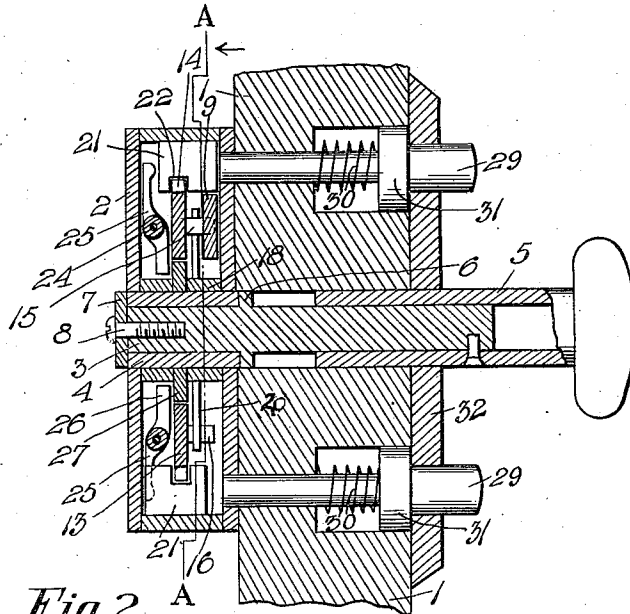
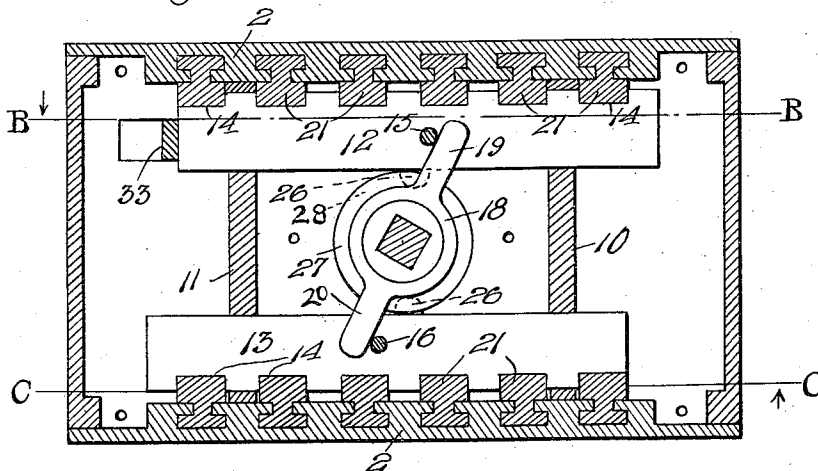


Fig. 2.



WITNESSES

Chas. Spring
Wm. Blake Lock

INVENTOR

Omenzo G. Dodge
Richard B. Clevin
Attorney

O. G. DODGE.
COMBINATION LOCK.
APPLICATION FILED NOV. 25, 1910.

1,019,136.

Patented Mar. 5, 1912.

2 SHEETS—SHEET 2.

Fig. 3.

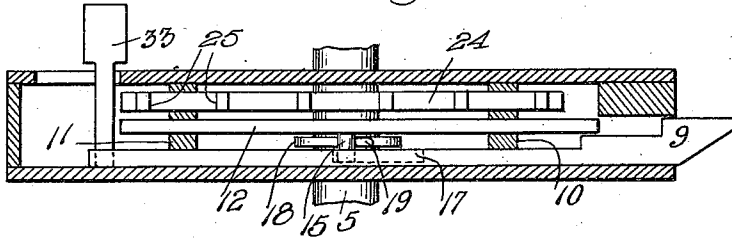


Fig. 4.

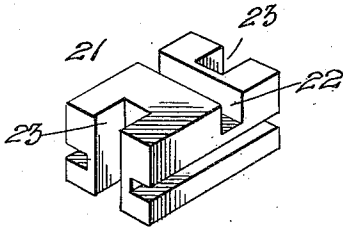
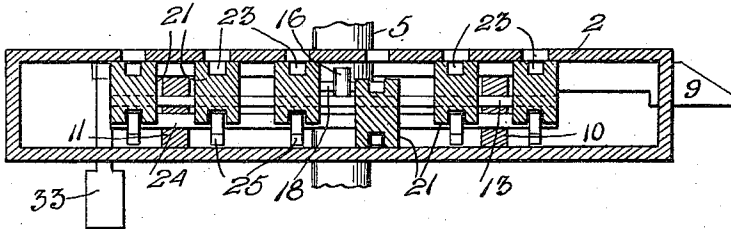


Fig. 5.

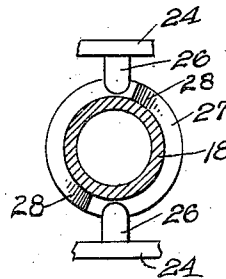


Fig. 6.

WITNESSES
O. M. Spring
L. B. Kellock

INVENTOR
O. G. Dodge,
Richard B. Owen,
Attorney

UNITED STATES PATENT OFFICE.

OMENZO G. DODGE, OF WASHINGTON, DISTRICT OF COLUMBIA.

COMBINATION-LOCK.

1,019,136.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed November 25, 1910. Serial No. 594,177.

To all whom it may concern:

Be it known that I, OMENZO G. DODGE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Combination-Locks, of which the following is a specification.

My invention relates to locks, and more particularly to a combination lock of the push-pin type.

The object of my invention is to provide a combination lock of this type, which will be a substitute for the key locks now in use on doors and in all similar places, and which may be readily operated in the dark.

Another object of my invention is to provide such a lock which shall have a sufficient number of combinations to afford security, and which may have its combination easily changed at any time.

A still further object of my invention is to provide a lock having a slidable locking bar, the movement of which is impeded or obstructed by means of a plurality of slotted blocks, which blocks are slidable transversely of the locking bar, and adapted to be moved in such manner as to bring their slots in alinement and in the same plane as the locking bar, thus permitting the latter to be moved and the lock operated.

A still further object is to provide a lock of the foregoing construction, in which a movement of the handle moves all of the blocks forward, from which position certain blocks forming the combination are moved rearwardly, independent of one another, whereby their slots are brought into alinement.

Still another object of the invention is to provide a lock of this type, which shall be substantial and durable, inexpensive to construct, and quick and simple in operation.

With the foregoing and other objects in view, my invention consists in such details of construction and in the arrangement and combination of parts as will be hereinafter more fully described and specifically pointed out in the appended claims.

As shown on the drawings and hereinafter described the form of lock known as a "night latch" is followed. It is to be understood however that the locking mechanism comprised in my invention is equally applicable to other forms of locks, and that

I do not confine my claims to the particular form used for purposes of description and illustration.

In describing my invention in detail reference will be had to the accompanying drawings, in which like characters denote like or corresponding parts throughout the several views and in which,

Figure 1 is a vertical sectional view of my lock as applied to a door. Fig. 2 is a vertical section taken upon the line A. A. of Fig. 1. Fig. 3 is a horizontal section on the line B. B. of Fig. 2. Fig. 4 is a similar section taken on the line C. C. of Fig. 2. Fig. 5 is a detailed view in perspective of one of the blocks and Fig. 6 is a detailed view showing the cam mechanism by which the blocks are moved forward.

In carrying my invention into practice I provide a casing 2, similar to those now in use, it being attached to the side of a door 1, or to a similar object. Passing through an aperture in said door is the usual spindle 3 adapted to register with the cylinder 4 and to receive shank 5 which carries the usual knob or handle. It will be readily understood that as far as the knob is concerned, this arrangement permits of adjustments to fit varying thickness of doors. To prevent the spindle 3 from slipping from the lock a collar 6, which may be cast integral with the spindle, and a washer 7, secured to the spindle by a screw 8, may be provided as shown.

The usual spring return reciprocating latch 9 is mounted so as to slide longitudinally of the casing and is supported in apertures provided for the purpose in partitions 10 and 11 and also in the aperture provided in the end of the casing. Similarly supported in partitions 10 and 11 are two locking bars 12 and 13, one being disposed in the upper part of the casing, adjacent to the latch, while the other is in the lower portion. It will be understood that I provide two of these bars simply to increase the number of possible combinations using a fixed or determined length of lock. One locking bar may be used if desired, and will be found to give excellent results, but two are preferred for the above reason and others which will be more fully set forth in the description. I do not desire to be limited to the number used, but wish it to be under-

stood that one or more form my invention. It will also be seen that in order to produce a much larger number of possible combinations two or more of these locks may be used
 5 in tandem, the respective locking bars being joined to form a continuous bar through all so used. The edges of the bars 12 and 13 which are nearer the outer casing of the lock are formed with a plurality of recesses
 10 or grooves 14 suitably spaced apart. The number of such spaces is not limited, it depending entirely on the size of the lock and the number of combinations desired, but in the drawings I have elected to show six such
 15 slots in each bar. Bars 12 and 13, as shown, are exact duplicates and are interchangeable in position. Projecting laterally from these bars are pins 15 and 16, the first named shown as entering an elongated slot 17 in
 20 latch 9, as is illustrated in Figs. 1 and 3. It will be seen that this construction permits the latch to be operated by suitable means, as by the pin 33 in Fig. 3, from the back of the lock, without affecting the interior
 25 mechanism, but that in order to operate it from the front a movement of bar 12, in the manner provided, is necessary.

The longitudinal movement of bars 12 and 13 may be accomplished in any of several
 30 different ways, but I have found the mechanism illustrated in the drawings to be well adapted for this purpose. Mounted upon and secured to the cylinder 4 is a collar 18, having outwardly extending arms 19 and
 35 20 opposite one another. One of said arms is adapted to engage pin 15, while the other engages pin 16. It will be seen that when the spindle 3 is rotated, through the medium of the knob or handle, in one direction, cyl-
 40 nder 4, ring 18, and the arms 19 and 20 will be similarly rotated, and the bars 12 and 13 will be moved longitudinally in directions opposite to one another. The move-
 45 ment of bar 12 will cause the latch 9 to move in the same direction thus permitting the door to be opened. Similarly the latch 9 may be mounted to operate with bar 13 through the medium of pin 16, from the op-
 50 posite end of the lock casing.

In order to form the combination, it will be seen that some means must be provided to impede or obstruct the movement of bars 12 and 13, said means being adapted to be
 55 brought into such position, through the operation of suitable mechanism, as to permit the movement of said bars. This result I accomplish by providing a plurality of
 60 blocks 21, mounted in guide ways which may, as shown, be formed in or carried by the casing of the lock. The number of blocks to be used is determined by the total number of possible combinations it is de-
 65 sired to produce, and corresponds as a rule with the number of grooves 14 in the locking bars 12 and 13. The said blocks are mov-

able transversely to the bars 12 and 13, and operate in the grooves 14. They are cut away or grooved on the face adjacent to the
 said locking bars, as shown at 22 Figs. 1 and 5, in such a manner as to permit a move-
 70 ment of the said bars 12 and 13 when the blocks are so disposed that the grooves 22 of all of them are brought into alinement in the plane of the bars. It is apparent that
 75 when one or more of the blocks are so disposed that the grooves are not in the plane of the bars, movement of the bars is prevented, and the mechanism is locked. For the purpose of greater compactness in the
 80 device, as will be hereinafter more fully understood, grooves 23 are cut in one end of each of the blocks 21 so that by reversing the position of said blocks some of the said
 85 grooves may be positioned in the front of the blocks while others are positioned in the rear thereof as illustrated in Fig. 4. For the purpose of illustrating and clearly de-
 90 scribing my invention I have elected to show the groove 22 as cut in the second quarter of the block 21, measuring from one end, but I do not limit my claim to blocks cut in this
 particular manner, as it will be readily under-
 95 stood that blocks cut in any manner, that will by simple movement permit or obstruct the movement of bars 12 and 13, will per-
 100 form essentially the function and in the same manner as the block I have illustrated. By reference to Fig. 1 it will be seen that to permit the necessary movement the length
 105 of the blocks 21 is made less than the distance between the front and back casings of the lock. A part of the blocks are mounted with the groove 22 nearer to the back of
 110 the lock, and such blocks must, as shown in Fig. 1, be moved toward the front of the lock to bring their grooves into alinement in the plane of bars 12 and 13. The re-
 115 mainder of the blocks are mounted with grooves 22 nearer to the front of the lock and must therefore be moved toward the back of the lock to aline their grooves in the plane of bars 12 and 13. These blocks
 21 are symmetrically constructed and are reversible end for end so that the combina-
 120 tion is determined by the manner of inserting the blocks and comprises those blocks in which groove 22 is nearer the front of the lock. Equally, to vary or entirely change the combination it is only necessary to with-
 125 draw and reverse the necessary blocks.

It has been shown that bars 12 and 13 can only be moved, through the mechanism provided for that purpose, when the grooves 22 in blocks 21 are brought into alinement in
 130 the planes of their respective bars, and that to produce this alinement a part of the blocks must be moved in one direction and the remainder in the opposite. In order to cause the grooves in the blocks to register with their respective bars, as above stated, I

have devised means to cause all of them to move simultaneously in one direction, here shown and described as toward the front of the lock, and other means for producing a selective individual movement of certain predetermined blocks in the opposite direction. The mechanism for producing a collective movement of all blocks comprises rock bars 24 extending longitudinally of the casing and pivoted in the partitions 10 and 11. Extending from these bars are a plurality of arms 25 which are of the same number as the blocks 21 there being one arm adapted to come in contact with the rear end of each block. The grooves shown in the blocks of Fig. 4 afford seats for arms 25 and permit blocks 21 to be pushed back in contact with the back casing of the lock. Lips 26 extend from the rock bars in the opposite direction or in other words inwardly toward the cylinder before mentioned and are adapted to be engaged by the inclined surfaces 28 of a cam faced ring 27 fixed upon said cylinder. Thus it will be seen that when cylinder 4 is turned in one direction, by means of the spindle 3 and the knob, the cam faces of ring 27, acting upon the lips 26, will rock the bars 24 and cause the arms 25 to push all of the blocks forward. This produces a condition where all the blocks 21, except those forming the combination, have their grooves 22 in the necessary registering position to permit movement of bars 12 and 13. I now proceed to push backward such blocks as form the combination. This is accomplished by means of a plurality of push pins 29, there being one for each block 21, passing through the door and casing of the lock so as to come in contact with the forward end of the blocks. Any person knowing the relative position of the blocks which have been mounted with the groove 22 nearer to the front of the lock, in other words knowing the combination, can push the pins corresponding in position to said blocks, thus bringing into alinement in the proper registering position the remainder of the blocks and producing the condition necessary to permit movement of bars 12 and 13 and the latch. Springs 30 are mounted to make the push pins self-restoring in order to destroy any visible record of the combination. Collars 31 mounted or formed upon the push pins afford a seat for the springs and serve, through the medium of door plate 32, to hold the said pins in position. Recesses in the door, preferably metal lined, afford space for the springs and collars. A door plate 32 is used not only to give a finished appearance but to serve also as a guide for the push pins 29 and the knob shanks 5.

The operation of my improved lock will be readily apparent from the foregoing. By turning the handle in one direction (to

the right as shown on the drawings) all the blocks are moved toward the front. Certain blocks forming the combination are then moved toward the back by means of the corresponding push pins. The handle or knob is then turned in the reverse direction (to the left as shown), operating the lock bars and the latch.

A knob or pin 33 may be provided by which the latch 9 can be operated from the inside of the door without using the combination or interfering with the mechanism, but this forms no part of my invention as this or similar devices are now in use.

From the foregoing it will be seen that I have provided a very simple but effective combination lock which may be used in every instance where the ordinary key lock is now used. The combination may be easily and quickly changed and the variations possible are unlimited.

I desire it to be understood that slight changes in the construction and the arrangement and combination of parts may be resorted to without departing from the spirit of my invention, provided such changes fall within the scope of the appended claims.

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

1. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks having slots therein adapted to aline when said blocks are in different relative positions, independent locking bars disposed transversely of said blocks and slidably mounted in said casing above and below the center thereof, said locking bars being provided with recesses in which said blocks are adapted to normally lie, whereby said locking bars are held immovable, a latch in said casing controlled by the movement of one of said locking bars, and means for alining the slots in said blocks whereby said locking bars are released.

2. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks having slots formed therein, said slots being adapted to register, bars in said casing normally locked by said blocks but adapted to be moved when said slots are registered, a latch controlled by the movement of one of said bars, and means for causing the slots in said blocks to register, said means comprising mechanism whereby all of said blocks are simultaneously moved in one direction and means whereby certain predesignated blocks forming the combination are independently moved in the other direction.

3. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks being provided with slots adapted to register, locking mecha-

nism adapted to be moved only when said slots are registered, and means for causing said slots to register, said means comprising a rock bar mounted in said casing, means extending from said rock bar engaging said blocks, mechanism for moving said bar and means for independently moving certain blocks in the other direction.

4. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks being provided with slots adapted to register, locking mechanism adapted to be moved only when said slots are registered, and means for causing said slots to register, said means comprising a rock bar mounted in said casing, a plurality of arms extending from said rock bar and adapted to engage one end of each block, a spindle in said casing, a cam faced ring on said spindle adapted to operate said rock bar when said spindle is revolved and means for independently moving certain blocks in the other direction.

5. A combination lock comprising a casing, a plurality of movable members therein, said movable members having grooves therein, a plurality of locking bars mounted in said casing above and below the center thereof and adapted to be moved when the grooves in said movable members are alined, a latch operated by the movement of said bars, and means for alining the grooves in said movable members.

6. A combination lock comprising a casing, a plurality of movable members mounted therein, said movable members being provided with slots adapted to be alined, locking bars in said casing adapted to be moved only when said slots are alined, and means for alining said slots, said means comprising mechanism adapted to move all of said movable members in one direction and separate means for moving certain of said moved members in a different direction.

7. A combination lock comprising a casing, movable members provided with slots adapted to be alined, locking bars adapted to be moved only when said slots are alined, means for alining said slots, a latch bar operative in said casing, connecting means between one of said locking bars and said latch bar whereby the latter is operated when the former is moved, and means for moving said locking bars, said means comprising arms mounted on the spindle of

said lock, and means attached to said bars adapted to be engaged by said arms.

8. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks having slots therein adapted to register, locking bars adapted to be moved only when said slots are registered, a latch bar operatively connected to one of said locking bars, and means whereby the slots in said blocks are caused to register, said means comprising mechanism whereby all of said blocks are moved in one direction and means for moving certain predestinated blocks forming the combination in the other direction.

9. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks having slots therein adapted to register, locking bars adapted to be moved only when said slots are registered, a latch bar operatively connected to one of said locking bars, and means whereby the slots in said blocks are caused to register, said means comprising mechanism whereby all of said blocks are moved in one direction and means for moving certain predestinated blocks forming the combination in the other direction, said latter means comprising a plurality of push pins adapted to engage one end of each of said blocks.

10. A combination lock comprising a casing, a plurality of blocks slidably mounted therein, said blocks having slots therein adapted to register, locking bars adapted to move only when said slots are registered, a latch bar operatively connected to one of said locking bars, and means whereby the slots in said blocks are caused to register, said means comprising mechanism whereby all of said blocks are moved in one direction and means for moving certain predestinated blocks forming the combination in the other direction, said latter means comprising a plurality of push pins adapted to engage one end of each of said blocks, said push pins operating independently of said blocks whereby the former may be restored to their normal position without disturbing the set position of the latter, and means for restoring said push pins to their normal position.

OMENZO G. DODGE.

Witnesses:

RICHARD B. OWEN,
D. BLAKELOCK.