

J. CALDWELL.

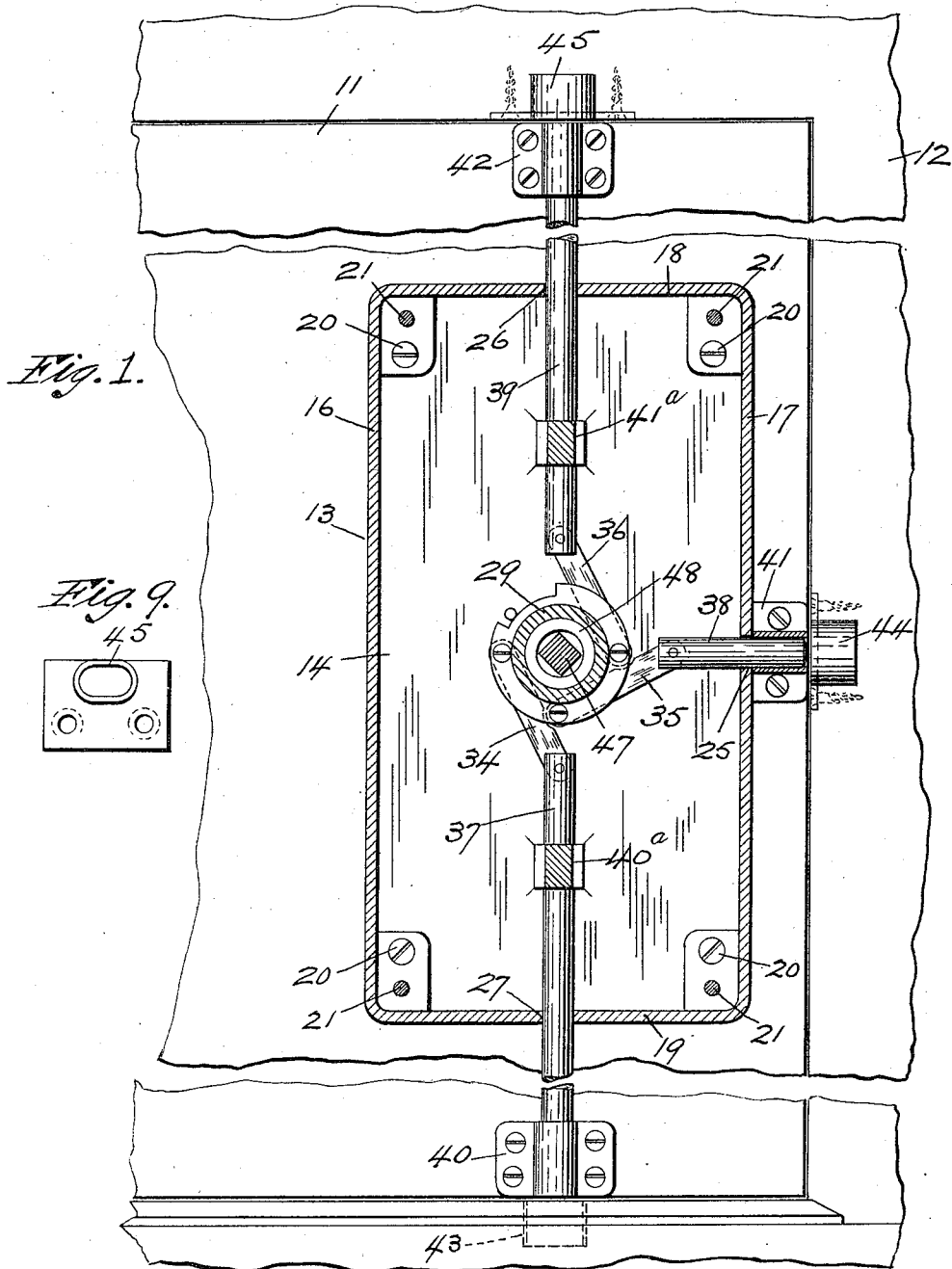
DOOR LOCK.

APPLICATION FILED JUNE 22, 1912.

1,046,438.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 1.



Witnesses:
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John Caldwell
By his Attorney
W. T. Griswell

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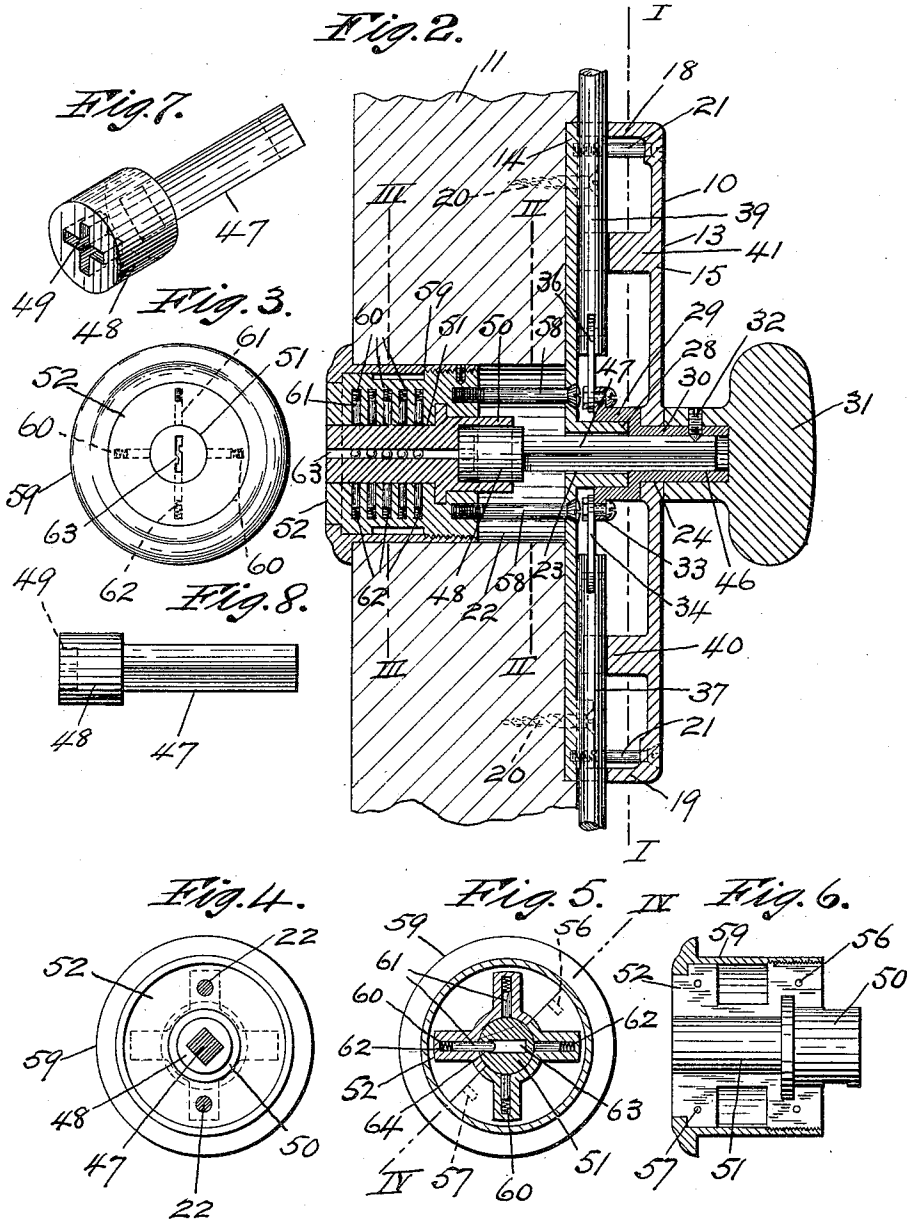
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UNITED STATES PATENT OFFICE.

JOHN CALDWELL, OF NEW YORK, N. Y., ASSIGNOR TO OTTO J. SCHWARZLER, OF NEW YORK, N. Y.

DOOR-LOCK.

1,046,438.

Specification of Letters Patent.

Patented Dec. 10, 1912.

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To all whom it may concern:

Be it known that I, JOHN CALDWELL, a citizen of the United States, and a resident of New York, county and State of New York, have invented a certain new and useful Improvement in Door-Locks, of which the following is a full, clear, and exact specification.

This invention relates to a class of locks adapted for use in conjunction with the doors of buildings, or other structures, and embodies an improved form of certain parts of the door lock shown in my Patent No. 1,028,929, issued June 11, 1912. In this form of door lock I employed a split cylinder in which is a rotatable key barrel. On one half of the cylinder provision is made at quarter turns for receiving tumbler pins which fit in suitable recesses and are subject to the action of springs. A key slot extends from the outside inwardly of the barrel, and said slot is provided with lateral apertures on one side which correspond with the position of the tumbler pins so that they may drop from the recesses of the cylinder into the apertures of the barrel. There are two sets of tumblers, and when in locking contact one set will be partly within the cylinder and partly within the barrel. The insertion of a key in the slot of the barrel will force the set of tumblers projecting in the apertures of the barrel back to its peripheral edge and into the recesses of the cylinder. By turning the key the barrel is rotated one quarter of a circle for unlocking the lock and may be reversely turned for locking it, thus limiting the operation of the lock and making it somewhat confusing to understand. Moreover, to the key barrel is connected one end of the shank of a knob so that the key barrel and the knob cannot be operated separately for locking or unlocking a door.

My present invention has for its object primarily to overcome these objections by providing a door lock which is adapted to be locked, or unlocked by the use of a key when turned to various determined portions of a circle, or by manually rotating a knob independently of the employment of a key. This is accomplished mainly by providing a cylinder adapted to carry any desired number of spaced sets of tumblers, or yielding locking elements, and in the cylinder is a rotatable barrel having a key slot and a

communicating recess so that by turning the barrel with a key for a determined distance the door may be locked, or unlocked as desired. In movable engagement with the barrel is one end of the spindle of a knob and in this end of said spindle is a recess in register with the slot of the barrel so that when a key is employed to operate the lock it will be received in the recess of the spindle so that it may be operated in unison with the barrel, or the knob may be rotated separately for revolving the spindle.

A further object of the invention is to provide a lock of simple and efficient construction, and which is susceptible of being made so as to be adapted to be applied upon any suitable door.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a fragmentary side elevation, partly broken away, and partly in section, of a door and its frame taken on a line I—I of Fig. 2, showing the casing, the bolts, and connecting parts of my improved door lock. Fig. 2 is a fragmentary vertical longitudinal section, partly in detail, of the lock and the door. Fig. 3 is a front elevation of the key barrel, cylinder, and shell of the lock. Fig. 4 is a section taken on the line II—II of Fig. 2. Fig. 5 is a section taken on the line III—III of Fig. 2. Fig. 6 is a section taken on the line IV—IV of Fig. 5. Fig. 7 is a perspective view of the spindle, of the lock. Fig. 8 is a side view of the spindle, and Fig. 9 is a top plan of one of the brackets employed on the door frame.

The device, or lock 10 may be applied upon the inside of any suitable door, as 11, which is preferably hinged so as to swing in a frame, as 12, constructed in a building, or other structure. The lock has a casing 13 which is substantially rectangular, or may be of any preferred shape, and said casing is provided with a base-plate 14, a front-plate 15, side walls 16 and 17, an upper wall 18, and a lower wall 19. The base-plate 14 may be fastened to the door by screws 20, or otherwise, and the front-plate may be secured to the base-plate by bolts 21, or the

like. Through the door is a large opening 22, and through the base-plate 14 and front-plate 15 of the casing are alined openings 23 and 24 which are in register with the opening in the door, but are considerably smaller in diameter. Midway of the side wall 17, the upper wall 18, and the lower wall 19 of the casing are openings 25, 26, 27. A boss or annular flange 28 is provided upon the base-plate 14 at the wall of the opening thereof, and said annular flange extends inwardly of the casing. Rotatable upon the annular flange 28 is a concentric flange 29 of a shank 30 which extends some distance through the opening 24 of the front-plate 15, and upon the free end of said shank is a knob 31 held rigidly to the shank by a screw 32, or the like so that the shank will be rotated when the knob is manually revolved.

Upon one end of the concentric flange 29 is an integrally formed ring 33, and to said ring may be pivoted one end of one or a plurality of links, or levers 34, 35, 36. To the opposite end of each of the links 34, 35, 36 are pivoted one end of bolts 37, 38, 39, two of which are adapted to be moved vertically and one laterally in unison when the shank 30 is revolved by the rotation of the knob 31, and each of the bolts 37 and 39 are movable in guides 40^a and 41^a provided upon the front plate 15 and extend into the casing 13. All of the bolts 37, 38, 39 are also movably guided through openings in the casing and through brackets 40, 41, 42 secured at the ends or sides of the door, and also upon the frame of the door are fastened brackets 43, 44, 45. One of the brackets 43, 44, 45 are in alinement with one of the brackets 40, 41, 42 so as to receive the free end of the bolts when moved to lock the door to the frame, and each of the brackets 43, 44, 45 are oval in shape so as to allow the ends of the bolts to be freely received in the brackets should said bolts be thrown out of alinement therewith by reason of shrinkage of the door or its frame. When the knob 31 is turned from right to left the shank 30 will be correspondingly rotated, and the levers 34, 35, 36 will be moved so as to direct the bolts into the brackets 43, 44, 45. The door will then be locked to the frame, and may be unlocked when the action of these parts are reversed by turning the knob from left to right. The above described parts of my door lock are substantially the same as shown in my Patent No. 1,028,929 and I desire it to be understood that I do not claim in this application any part thereof as being new and novel.

For the purpose of permitting the bolts 37, 38, 39 and the levers 34, 35, 36 to be moved in unison through the medium of a key for locking and unlocking the door independently of the knob 31, through the shank 30 of said knob is a square or angular

opening 46 in which is held a similar shaped spindle 47 which is of sufficient length to extend through the openings of the annular flange 28, the opening 23 of the base-plate 14 of the casing and into the opening 22 of the door. Upon the end of the spindle in the opening of the door is a circular head 48, and in the end of said head opposite to the spindle proper is a recess 49 which is formed in the shape of a cross so as to receive the end of a key when positioned either vertically or transversely. The head 48 of the spindle is movably seated in an annular flange 50 of a key-barrel 51 which is rotatable in a tumbler cylinder 52 disposed in the end of the opening 22 of the door which is opposite to the lock casing so as to be upon the outside of the door.

The tumbler cylinder 52 is preferably formed in two parts, as shown in Fig. 5. In one part of the cylinder are recesses 56 and 57 into which is snugly seated corresponding pins provided upon the second part when both parts are assembled. The cylinder 52 is held against rotation by being secured to the base-plate 14 of the lock casing by means of a number of bolts, or screws 58. One part of the peripheral edge of said cylinder is threaded so that the threaded end of a ferrule or shell 59 may be screwed thereon, and the opposite end of said ferrule is flanged so as to provide a neat finish for the lock upon the outer face of the door when in place for operation. In the wall of the cylinder 52, and communicating with its passage are a number of series of alined recesses 60 which are radially disposed with respect to the axial center of the cylinder. I prefer to employ one series of the recesses at each part of the cylinder corresponding to a quadrant thereof, as illustrated, though it is evident that I may provide one or any suitable number of series of these recesses. In each series of the recesses 60 are sets of movable tumblers 61, one tumbler being disposed in each recess, and serving to force each tumbler in a direction outwardly of said recess and toward the key-barrel 51, in each recess is a spring 62.

Longitudinally through the key-barrel 51 is provided a key slot 63 which communicates with the cross-shaped recess 49 of the head 48 of the spindle 47. In one part of the wall of the key barrel 51 is also a recess 64 which communicates with one edge of the key slot 63, and said recess 64 adapted to be registered with each of the series of alined recesses 60 of the cylinder to receive one of the sets of tumblers 61 for locking the key barrel, the cylinder, and the other parts of the lock. To move the levers 34, 35, 36 and the bolts 37, 38, 39 by the use of a key so as to lock or unlock the door the key is inserted in the slot 63 of the key-barrel 51 and its end will be guided into

the recess 49 of the head 48 of the spindle. The set of tumblers seated in the recess 64 of the key-barrel will thereby be forced by contact with the key to the peripheral edge of the key-barrel and back into their recesses of the cylinder. By turning the key from right to left one-quarter of a circle, or turning it so that the recess 64 of the barrel will be in register with the next set of tumblers the spindle 47 and the knob 31 will be rotated for withdrawing the bolts 37, 38, 39 from engagement with the brackets 43, 44, 45 so as to unlock the door. On extracting the key the second set of tumblers will be partly forced into the recess of the key barrel, and the barrel and its cylinder will again be locked together. The door may then be locked from the inside independently of the use of the key by simply turning the knob 31. By repeating the use of the key in this manner and turning the door knob as described the door may be locked or unlocked whenever desired without reversing the rotation of the key barrel, though it is evident that the key may be employed for locking the door as well as unlocking it by turning it from left to right after being inserted in the slot of the barrel.

In the foregoing description I have embodied the preferred form of my invention, but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without departing from the principle, or sacrificing any of the advantages of this invention, therefore I reserve to myself the right to make such changes as fairly fall within the scope thereof.

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

1. In a door lock, a spindle having a locking bolt movably connected thereto, and a knob upon one of its ends, a head formed upon the opposite end of the spindle, said head having a recess therein, a cylinder, a barrel rotatable in the cylinder, an annular

flange formed upon one end of the barrel and movably positioned over the head of the spindle, said barrel having a slot there- through which communicates with the recess of the head of the spindle whereby a key when inserted in the slot will be received in the recess of the spindle so as to rotate the spindle simultaneously with the rotation of the barrel, or to permit the spindle to be rotated independently by manually rotating the knob.

2. In a door lock, a cylinder having a plurality of series of alined recesses disposed radially with respect to its axial center and all of the recesses communicating with the interior of the cylinder, a plurality of sets of yielding tumblers, each set being movable in one of the series of alined recesses of the cylinder, a barrel rotatable in the cylinder, said barrel having a key slot therethrough and having a recess in its wall in communication with one edge of the slot, said recess being adapted to receive each set of the tumblers of the cylinder separately when the barrel is rotated by a key so that its recess is in register with the corresponding series of alined recesses of the cylinder, an annular flange extending from one end of the barrel, a spindle having locking bolts movably connected thereto and having a knob upon one of its ends, and a head formed upon the opposite end of the spindle and movably seated in the annular flange of the barrel, said head having a cross-shaped recess therein which communicates with the slot of the barrel whereby a key when inserted in the slot will be received in the recess of the spindle so as to be rotated simultaneously with the rotation of the barrel, or to permit the spindle to be rotated independently by manually rotating the knob.

This specification signed and witnessed this twenty first day of June, A. D. 1912.

JOHN CALDWELL.

Witnesses:

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M. DERMODY.